

IN THE CLAIMS:

The following is a complete listing of the claims, and replaces all earlier versions and listings.

Claim 1 (currently amended): An information processing method for calculating a first parameter used to transform a measured value of a sensor into a position and orientation of an image sensing unit, the sensor comprising a transmitter and a receiver, said method comprising the steps of:

acquiring the measured value of the sensor when an image of the transmitter, placed in a real space, is captured at or nearly at the center of a captured image, the image being captured by the image sensing unit to which the receiver is attached; and

acquiring the measured value of the sensor upon adjusting the position and orientation of the image sensing unit to capture an image of a transmitter of the sensor in a real space; and

calculating [[said]] the first parameter using the measured value of the sensor,

wherein the transmitter of the sensor is also placed at the origin of a sensor coordinate system.

Claim 2 (currently amended): [[The]] A method according to claim 1, further comprising:

superimposing a virtual image of the transmitter on [[a]] the captured image on the basis of the calculated first parameter, and displaying the captured image superimposed with the virtual image of the transmitter; and

inputting a user's instruction associated with an adjustment value of the calculated first parameter, and updating the virtual image in accordance with the adjustment value.

Claim 3 (currently amended): [[The]] A method according to claim 2, further comprising setting a second parameter used to calculate a position and orientation of the transmitter on a world coordinate system in accordance with a user's manual instruction.

Claim 4 (currently amended): [[The]] A method according to claim 3, wherein [[the]] said method optimizes a third parameter used to transform [[a]] the measured value of the sensor into a position and orientation of the image sensing unit on [[a]] the world coordinate system using the set first and second parameters, and further comprises comprising the steps of:

acquiring [[a]] another captured image, obtained by capturing an image of the real space, where a plurality of markers whose known world coordinate positions ~~are known~~ are laid out, using the image sensing unit[[,]] and [[a]] the measured value of the sensor upon capturing the image;

detecting positions of the plurality of markers included in the other captured image; and

optimizing the third parameter using the measured value of the sensor, the positions of the detected markers, and the world coordinate positions of the detected markers.

Claim 5 (currently amended): A program for making a computer implement an information processing method for calculating a first parameter used to transform a measured value of a sensor into a position and orientation of an image sensing unit, the sensor comprising a transmitter and a receiver, said program comprising:

code for a step of acquiring the measured value of the sensor when an image of the transmitter, placed in a real space, is captured at or nearly at the center of a captured image, the image being captured by the image sensing unit to which the receiver is attached; and

a program of a step of acquiring the measured value of the sensor upon adjusting the position and orientation of the image sensing unit to capture an image of a transmitter of the sensor in a real space; and

a program of code for a step of calculating [[said]] the first parameter using the measured value of the sensor,

wherein the transmitter of the sensor is also placed at the origin of a sensor coordinate system.

Claim 6 (currently amended): [[The]] A program according to claim 5, further comprising:

~~a program of code for a step of superimposing a virtual image of the transmitter on [[a]] the captured image on the basis of the calculated first parameter, and displaying the captured image superimposed with the virtual image of the transmitter; and~~

~~a program of code for a step of inputting a user's instruction associated with an adjustment value of the calculated first parameter, and updating the virtual image in accordance with the adjustment value.~~

Claim 7 (currently amended): An information processing apparatus for calculating a first parameter used to transform a measured value of a sensor into a position and orientation of an image sensing unit, ~~the sensor comprising a transmitter and a receiver, said apparatus comprising:~~

~~an acquisition unit adapted to acquire the measured value of the sensor when an image of the transmitter, placed in a real space, is captured at or nearly at the center of a captured image, the image being captured by the image sensing unit to which the receiver is attached; and~~

~~unit adapted to acquire the measured value of the sensor upon adjusting the position and orientation of the image sensing unit to capture an image of a transmitter of the sensor in a real space, and~~

~~a calculation unit adapted to calculate said calculated first parameter using the measured value of the sensor,~~

~~wherein the transmitter of the sensor is also placed at the origin of a sensor coordinate system.~~

Claim 8 (currently amended): [[The]] An information processing apparatus according to claim 7, further comprising:

a unit adapted to superimpose a virtual image of the transmitter on [[a]] the captured image on the basis of the calculated first parameter, and to display the captured image superimposed with the virtual image of the transmitter; and

an input unit adapted to input a user's instruction associated with an adjustment value of the calculated first parameter, and update the virtual image in accordance with the adjustment value.

Claim 9 (canceled)

Claim 10 (new): An information processing method for calculating a first parameter used to transform a measured value of a sensor into a position and orientation of an image sensing unit, the sensor comprising a transmitter and a receiver with the receiver of the sensor being attached to the image sensing unit, said method comprising the steps of:

acquiring the measured value of the sensor upon adjusting the position and orientation of the image sensing unit to capture an image of the transmitter in a real space;

calculating the first parameter using the measured value of the sensor;

superimposing a virtual image of the transmitter on the captured image on the basis of the calculated first parameter; and

inputting a user's instruction associated with an adjustment value of the calculated first parameter, and updating the virtual image in accordance with the adjustment value.

Claim 11 (new): A method according to claim 10, further comprising the step of setting a second parameter used to calculate a position and orientation of the transmitter on a world coordinate system in accordance with a user's manual instruction.

Claim 12 (new): A method according to claim 11, wherein said method optimizes a third parameter used to transform the measured value of the sensor into a position and orientation of the image sensing unit on the world coordinate system using the set first and second parameters, and further comprising the steps of:

acquiring another captured image obtained by capturing an image of the real space, where a plurality of markers, the world coordinate positions of which are known, are laid out using the image sensing unit and the measured value of the sensor upon capturing the image;

detecting positions of the plurality of markers included in the another captured image; and

optimizing the third parameter using the measured value of the sensor, the positions of the detected markers, and the world coordinate positions of the detected markers.

Claim 13 (new): A program for making a computer implement an information processing method for calculating a first parameter used to transform a measured value of a sensor into a position and orientation of an image sensing unit, the sensor comprising a transmitter and a receiver with the receiver being attached to the image sensing unit, said program comprising:

code for a step of acquiring the measured value of the sensor upon adjusting the position and orientation of the image sensing unit to capture an image of the transmitter in a real space;

code for a step of calculating the first parameter using the measured value of the sensor;

code for a step of superimposing a virtual image of the transmitter on the captured image on the basis of the calculated first parameter; and

code for a step of inputting a user's instruction associated with an adjustment value of the calculated first parameter, and updating the virtual image in accordance with the adjustment value.

Claim 14 (new): An information processing apparatus for calculating a first parameter used to transform a measured value of a sensor into a position and orientation of an image sensing unit, the sensor comprising a transmitter and a receiver with the receiver of the sensor being attached to the image sensing unit, said apparatus comprising:

an acquisition unit adapted to acquire the measured value of the sensor upon adjusting the position and orientation of the image sensing unit to capture an image of the transmitter in a real space;

a calculation unit adapted to calculate the first parameter using the measured value of the sensor;

a unit adapted to superimpose a virtual image of the transmitter on the captured image on the basis of the calculated first parameter; and

an input unit adapted to input a user's instruction associated with an adjustment value of the calculated first parameter, and updating the virtual image in accordance with the adjustment value.